

- 14 -

CLAIMS

1. An environment monitoring system (100), comprising:

- 5 - at least an unmanned, ground local device (1), apt to be installed in the environment to be monitored and having acquisition means (7, 8, 9, 10) for acquiring environmental data apt to detect critical thermal variations in the area of interest;
- a central control station (101), comprising storage means (102) for storing logistical-technical data and data about the available intervention means pertaining to the monitored environment;
- 10 - means (12) for transmitting/receiving data, for bilateral communication between said central control station (101) and said at least one local device (1); and
- means (103) for the integrated processing of the environmental data acquired by said at least one local device (1) and of the data contained in said storage means (102), apt to provide as their output a model of evolution of the thermal front consequent to a critical thermal variation and an intervention plan for
- 15 limiting the damages associated therewith,

wherein said acquisition means of said at least one local device (1) comprises: fire detection means (9) for detecting energy emissions in the infrared range; meteorological data detection means (10); and image acquisition means (7) comprising at least a telecamera (8) that operates in the visible range, wherein said fire detection means (9) are apt to determine the activation of said telecamera (8) in response to the detection of energy emissions exceeding a predetermined threshold, and wherein said at least one local device (1) comprises also self-powering means (13, 14) and a support structure (3) supporting said acquisition means (9) and apt to be anchored to the ground at a desired location.

25 2. The system (100) as claimed in claim 1, comprising a plurality of local devices (1) apt to be installed in the environment to be monitored.

30 3. The system (100) as claimed in any of the previous claims, comprising means (17) for processing the energy emissions detected by said detection means (9) apt to analyse said emissions on a plurality of emission bands.

 4. The system (100) as claimed in any of the previous claims, wherein said detection means (9) comprise at least a thermo-camera operating in the infrared range.

35 5. The system (100) as claimed in the previous claim, wherein said thermo-camera is provided with an infrared micro-bolometric sensor.

 6. The system (100) as claimed in any of the previous claims, wherein said means (12) for transmitting/receiving data are able to transmit images from said one or more

- 15 -

local devices (1) to said central control station (101) in a visible and/or infrared mode.

7. The system (100) as claimed in any of the previous claims, wherein said meteorological data detection means (10) comprise acquisition means selected within a group comprising means for measuring wind velocity and direction, humidity, pressure, air and ground temperature and dew temperature.

8. The system (100) as claimed in the previous claim, wherein said meteorological data detection means (10) are implementable with sensors for detecting parameters considered necessary for the correct analysis of the phenomenon of thermal variations and of its model of evolution.

9. The system (100) as claimed in any of the previous claims, wherein said acquisition means comprise location means (11) apt to allow the automatic determination of the geographic co-ordinates of the related local device (1).

10. The system (100) as claimed in any of the previous claims, comprising means (17, 11) apt to determine the geographic co-ordinates of a thermal variation detected by said means (9) for acquiring environmental data.

11. The system (100) as claimed in any of the previous claims, wherein at least one of said one or more local devices (1) comprises local processing means (17) of the acquired data.

12. The system (100) as claimed in any of the previous claims, wherein at least one of said one or more local devices (1) comprises local storage means (18) of the acquired data.

13. The system (100) as claimed in any of the previous claims, wherein said support structure (3) for supporting said acquisition means (9) has a substantially tripod shape.

14. The system (100) as claimed in the previous claim, wherein said support structure (3) comprises a platform (6) positioned in correspondence with an upper portion of the structure itself.

15. The system (100) as claimed in any of the previous claims, wherein at least one of said one or more local devices (1) comprises a rotatable platform (93) for supporting said acquisition means (7, 8, 9, 10).

16. The system (100) as claimed in any of the previous claims, wherein said intervention plan contains the indication of at least one optimal access path for reaching the area involved by a critical thermal variation.

17. The system (100) as claimed in any of the previous claims, wherein said intervention plan contains an estimate of the starting and/or ending times of the intervention.

- 16 -

18. The system (100) as claimed in any of the previous claims, wherein said central control station (101) comprises interface means (104) to allow the operators to select an intervention plan and wherein said integrated processing means (103) are apt to adaptively modify said model of evolution of the thermal front according to the intervention plan selected by the operators of said central control station (101).

19. The system (100) as claimed in any of the previous claims, wherein said integrated processing means (103) comprise means apt to classify the detected thermal variation according to a danger index.

20. The system (100) as claimed in any of the previous claims, wherein said central control station (101) comprises interface means (104) apt to communicate to the operators the data acquired by the one or more local devices (1) and the output data from said integrated processing means (103) and apt to allow the interrogation of said storage means (102).

21. The system (100) as claimed in any of the previous claims, wherein said central control station (101) comprises interface means (104) apt to allow the management of said acquisition means (7, 8, 9, 10) of the one or more local devices (1) by the operators of said central station.

22. The system (100) as claimed in any of the previous claims, comprising means (105) for communicating with agencies for implementing said intervention plan.

23. A method for environmental monitoring, comprising the phases of:

(a) installing on the territory to be monitored at least one unmanned, ground local device (1) having acquisition means (7, 8, 9, 10) for acquiring environmental data apt to detect critical thermal variations in the area of interest;

(b) storing in a central control station (101) logistical-technical data and data about the available intervention means relating to the monitored environment; and

(c) processing, in an integrated mode, the acquired environmental data and the stored logistical-technical data in such a way as to provide a model of evolution of the thermal front consequent to a critical thermal variation and an intervention plan for limiting the damages associated therewith,

wherein said acquisition means of said at least one local device (1) comprises: fire detection means (9) for detecting energy emissions in the infrared range; meteorological data detection means (10); and image acquisition means (7) comprising at least a telecamera (8) that operates in the visible range, wherein said fire detection means (9) are apt to determine the activation of said telecamera (8) in response to the detection of energy emissions exceeding a predetermined threshold, and wherein said at least one local device (1) comprises self-powering means (13, 14) and a support structure (3) supporting said acquisition means (9) and apt to be

- 17 -

anchored to the ground at a desired location.

24. The method as claimed in claim 23, wherein said phase (a) provides for installing a plurality of acquisition means (7, 8, 9, 10) distributed in the environment to be monitored.

5 25. The method as claimed in claim 23 or 24, comprising a phase of processing the energy emissions detected by said detection means (9) wherein the acquired data are analysed on a plurality of emission bands.

26. The method as claimed in any of the claims from 23 to 25, comprising of phase of transmitting data from said acquisition means (9) to said central control station
10 (101) that provides for the transmission of images in a visible and/or infrared mode.

27. The method as claimed in any of the claims from 23 to 26, comprising a phase of determining the geographic co-ordinates of a thermal variation detected by said means (9) for acquiring environmental data.

15 28. The method as claimed in any of the claims from 23 to 27, wherein said intervention plan contains the indication of at least one optimal access path for reaching the area affected by a critical thermal variation.

29. The method as claimed in any of the claims from 23 to 28, wherein said intervention plan contains an estimate of the starting and/or ending times of the intervention.

20 30. The method as claimed in any of the claims from 23 to 29, wherein said phase (c) provides for an adaptive modification of the evolution model of the thermal front according to the intervention plan selected by the operators of said central control station (101).

25 31. The method as claimed in any of the claims from 23 to 30, wherein said phase (c) provides for classifying the detected thermal variation according to a danger index.